CLEAN VERSION OF PENDING CLAIMS

1. A method of detecting microorganisms in a sample by means of a nucleic acid probe comprising the following steps:

   a) fixing the microorganisms contained in the sample;

   b) incubating the fixed microorganisms with the detectable nucleic acid probe molecules;

   c) removing nonhybridized nucleic acid probe molecules;

   d) separating the hybridized nucleic acid probe molecules without using formamide and

   e) detecting the separated nucleic acid probe molecules.

2. A method according to Claim 1, wherein the separated nucleic acid probe molecules in step e) are also quantified.

3. (AMENDED) A method according to Claim 1, wherein the separation solution used in step d) is selected from the group consisting of water, buffered water, DMSO and SSC.

4. A method according to Claim 3, wherein the separation solution is 0.001 - 1.0 M Tris/HC1, pH 9.0 +/- 2.0.

5. (AMENDED) A method according to Claim 3, wherein the separation solution is 0.01 M Tris/HC1, pH 9.0 +/- 2.0.

6. (AMENDED) A method according to Claim 1, wherein step d) is carried out at a temperature of 50 to 100 °C.

7. (AMENDED) A method according to Claim 1, wherein step d) is carried out at a temperature lower than 100 °C.

8. (AMENDED) A method according to Claim 1, wherein step d) is carried out at a temperature of approximately 80 °C.

9. (AMENDED) A method according to Claim 1, wherein the nucleic acid probe is complementary to a chromosomal or episomal DNA, an mRNA or rRNA of a microorganism to be detected.

10. (AMENDED) A method according to Claim 1, wherein the nucleic acid probe is covalently bonded to a detectable marker.

11. A method according to Claim 10, wherein the detectable marker is selected from the group of the following markers:

   a) fluorescence markers,
   b) chemoluminescence markers,
   c) radioactive markers,
   d) enzymatically active group,
   e) haptene,
   f) nucleic acid detectable by hybridization.

12. (AMENDED) A method according to Claim 1, wherein the microorganism is a single-cell microorganism.

13. (AMENDED) A method according to Claim 1, wherein the microorganism is a yeast, a bacterium, an alga or a fungus.

14. A method according to Claim 13, wherein the microorganism belongs to the genus *Salmonella*.

15. (AMENDED) A method according to Claim 1, wherein the sample is an environmental sample taken from water, soil or air.

16. (AMENDED) A method according to Claim 1, wherein the sample is a food sample.

17. A method according to Claim 16, wherein the sample is taken from milk or milk products, drinking water, beverage, baked products or meat products.

18. (AMENDED) A method according to Claim 1, wherein the sample is a medicinal sample.

19. A method according to Claim 18, wherein the sample is taken from tissue, secretions or fecal matter.

20. (AMENDED) A method according to Claim 1, wherein the sample is taken from wastewater.

21. A method according to Claim 20, wherein the sample is taken from activated sludge, putrefactive sludge or anaerobic sludge.

22. (AMENDED) A method according to Claim 1, wherein the sample is taken from a biofilm.

23. A method according to Claim 22, wherein the biofilm is taken from an industrial plant, is formed in purification of wastewater or is a naturally occurring biofilm.

24. (AMENDED) A method according to Claim 1, wherein the sample is taken from a pharmaceutical or cosmetic product.

25. (AMENDED) A kit for carrying out the method according to Claim 1, containing
 a) at least hybridization buffer,
 b) at least one nucleic acid probe,
 b1) for specific detection of a microorganism,

b2) for performing a negative control.

26. A kit according to Claim 25, containing at least one specific probe for detection of bacteria of the genus Salmonella.

27. A kit according to Claim 26, containing the nucleic acid probes

Salm63: 5'-TCGACTGACTTCAGCTCC-3'

and

NonSalm: 5'-GCTAACTACTTCTGGAGC-3'

or a nucleic acid probe that differs from Salm 63 and/or NonSalm by a deletion and/or an addition, whereby the ability of this probe to hybridize with Salmonella-specific nucleic acid is maintained, or a nucleic acid that can hybridize with the aforementioned nucleic acids.